

above 2800 m.; mosses are common about springs up to 3600 m., but liverworts are entirely lacking. More than one-half the species (210) are classed as belonging to the central Andes, 60 being endemic. There are no endemic genera, but notable among this group are such aggregates as 6 species of *Adesmia*, 2 of *Boopis*, 12 of *Senecio*, and 2 new varieties of *Koeleria*. The other elements are the northern tropical with 16 species, the subtropical with 21 species, the basal Argentinian with 56 species, the southern Andean with 10 species, the Patagonian with 73 species, and the cosmopolitan and introduced species numbering respectively 28 and 17. This introduced element must be regarded as small when it is recalled that the Mendoza River valley has been the trans-Andean route for centuries.

Photographs and careful drawings of many of the interesting forms add much to the value of the report.—GEO. D. FULLER.

Crop centers.—A great service in unifying ecology and agriculture has recently been rendered by WALLER,¹³ who has illustrated by well chosen examples the close relation that exists between crop and vegetation centers. TRANSEAU has shown how closely vegetation centers are indicated by a map showing the ratio of rainfall to evaporation, and WALLER now emphasizes the fact that corn, wheat, and similar crops show strikingly similar relations. It is often said that crops are moving west or north, which merely means for the most part that we are finding their range. For example, wheat was first cultivated away from its proper center, so that in the last 70 years the center of wheat cultivation has moved 700 miles west and 100 miles north. A fundamental difference between crops and native plants is that when the latter extend far beyond their range, it is chiefly in the poorest soil, since competition with plants proper to the district exclude them elsewhere. Crops grown at the edge of their range, however, must be grown in the best conditions available, and of course are exempt from competition. Special attention is paid to corn, wheat, and cotton, and the maps showing their distribution are very significant. Of course there are many complexities in working out the thesis. Economic considerations, such as problems of market and transportation, figure very largely. Considering its origin, the center of corn might be sought south; competition with cotton is thought to be the major factor here. The dominance of eastern Illinois in corn production, and of North Dakota in the production of spring wheat, are related to edaphic factors; in each case there is rich prairie soil.—H. C. COWLES.

Increasing catalase activity in yeast cells.—EULER and BLIX¹⁴ have determined the effect of various conditions and reagents upon the catalase activity

¹³ WALLER, A. E., Crop centers of the United States. Jour. Amer. Soc. Agron. 10:49-83. figs. 8. 1918.

¹⁴ EULER, H. V., and BLIX, R., Verstärkung der Katalasewirkung in Hefezellen. Hoppe-Seyler Zeit. Physiol. Chem. 105:83-114. 1919.